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10/663,026	09/15/2003	Harlan T. Beverly	P16580	2544

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EXAMINER
GOODCHILD, WILLIAM J

ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 June 2008*.
2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-39* is/are pending in the application.
       4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1-39* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
       Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
       Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
       a)☐ All   b)☐ Some * c)☐ None of:
       1.☐ Certified copies of the priority documents have been received.
       2.☐ Certified copies of the priority documents have been received in Application No. _____.
       3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
       Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
       Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (d) the invention was first patented or caused to be patented, or was the subject of an inventor's
> certificate, by the applicant or his legal representatives or assigns in a foreign country prior to the date
> of the application for patent in this country on an application for patent or inventor's certificate filed
> more than twelve months before the filing of the application in the United States.

2.   Claims 1-5, 14-20, 26-30 and 39 are rejected under 35 U.S.C. 102(e) as being

anticipated by Baratakke et al., (US Publication No. 2005/0036511), (hereinafter

Baratakke).

Regarding claims 1, 15 and 26, Baratakke discloses a system memory [paragraph 45];

a processor coupled to the system memory [paragraph 45];

a network adaptor [paragraph 45];

a data storage controller for managing Input/Output (I/O) access to the data storage

[paragraph 45]; and

a device driver executable by the processor in the memory [paragraph 45],

wherein at least one of the device driver and the network adaptor is adapted to:

establishing an active connection adapted to send packets of data between a host and

a destination [paragraphs 17-18];

receiving from the destination a first window value representing a first quantity of data

packets [paragraphs 17-19];

sending packets of data from said host to said destination [paragraphs 17-19];

receiving an acknowledgment from said destination for each packet of data received by

said destination [paragraphs 17-19]

wherein said first window value represents a limit imposed on said host by said

destination on the quantity of data packets sent from said host to said destination and

lacking an acknowledgment of being received by destination [paragraphs 17-19]; and

limiting the number of packets sent by the said host, but not acknowledged as received

by said destination, to a second quantity of data packets less than said first window

value [paragraph 22]

wherein said second quantity represents a limit imposed by said host on the quantity of

data packets sent from said host to said destination and lacking an acknowledgment of

being received by destination and where said second quantity is a function of the

number of active connections of the host [paragraphs 17 and 22].

Regarding claims 2, 17 and 27, Baratakke discloses the connection is a Transmission

Control Protocol connection between the host and the destination [paragraph 18] and

wherein said first window value is a Transmission Control Protocol send window value

[paragraph 19].

Regarding claims 3, 18 and 28, Baratakke discloses establishing a plurality of active

connections between the host and a plurality of destination [paragraph 17];

receiving from each destination a first window value representing a first quantity of data

packets for the connection [paragraphs 17-19];

sending packets of data from said host to each destination [paragraphs 17-19];

receiving an acknowledgment from each destination for each packet of data received by

each destination [paragraphs 17-19]

wherein the first window value of each connection represents a limit imposed on said

host by the destination of the connection on the quantity of data packets sent from said

host to the destination of the connection and lacking an acknowledgment of being

received by the destination of the connection [paragraphs 17-19]; and

limiting the number of packets sent by said host, to each connection, but not

acknowledged as received by the destination of each connection, to a second quantity

of data packets less than the window value of the connection [paragraph 22];

wherein the second quantity of each connection which is less than the window value of

the connection is based, at least in part, on the number of active connections of the host

[paragraphs 17 and 22].

Regarding claims 4, 19 and 29, Baratakke discloses said host has a plurality of

Transmission Control Protocol connections [paragraph 17],

each Transmission Control Protocol connection having a Protocol Control Block which

stores a Transmission Control Protocol send window value and a virtual window value

less than said Transmission Control Protocol send window value wherein each virtual window value limits the number of packets sent by said host, but not acknowledged as received by the destination of each Transmission Control Protocol connection, to a second quantity of data packets defined by the virtual window value of the Transmission Control Protocol connection [paragraph 22].

Regarding claims 5, 20 and 30, Baratakke discloses in response to the destination reducing the size of the Transmission Control Protocol send window value to a third quantity less than the second quantity, limiting the number of packets sent by said host, but not acknowledged as received by said destination, to a fourth quantity of data packets no greater than the reduced size of the Transmission Control Protocol send window value [paragraph 22-23].

Regarding claims 14 and 39, Baratakke discloses changing the size of the second quantity of packets limiting the number of packets sent by the host but not acknowledged as received by the destination prior to sending at least one packet [paragraph 22].

Regarding claim 16, Baratakke discloses the data storage comprises a magnetic storage medium [paragraph 45].

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims 6-13, 21-25 and 31-38 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Baratakke as applied to claims 1, 15 and 26 above, and further in

view of Boyd et al., (US Publication No. 2004/0049580), (hereinafter Boyd).

Regarding claims 6, 21 and 31, Baratakke does not specifically disclose establishing a

plurality of active direct memory access connections between said host and a plurality

of specified memory locations of a plurality of destinations; sending a plurality of

messages to specified memory locations of the destinations of the direct memory

access connections wherein each message comprises a plurality of data packets;

receiving message acknowledgments, each message acknowledgment being sent by a

destination for each message received by the destination; and establishing a plurality of

message limits, each message limit imposing a separate limit for each direct memory

access connection on the quantity of messages sent from said host to the specified

memory location of the direct memory access connection associated with the message

limit and lacking a message acknowledgment of being received by the destination of the

direct memory access connection associated with the message limit.

However, Boyd discloses an RDMA work request to read a virtually contiguous memory space on a remote node [Boyd, paragraph 76 and figure 19, multiple hosts, multiple destinations]. It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate RDMA to remote destinations in order to allow data to move directly form the memory of one computer to that of another computer without involving the operating system.

Boyd further discloses, sending a plurality of messages to specified memory locations of the destinations of the direct memory access connections wherein each message comprises a plurality of data packets [Boyd, paragraph 122]; receiving message acknowledgments, each message acknowledgment being sent by a destination for each message received by the destination [Boyd, paragraph 122]; and establishing a plurality of message limits, each message limit imposing a separate limit for each direct memory access connection on the quantity of messages sent from said host to the specified memory location of the direct memory access connection associated with the message limit and lacking a message acknowledgment of being received by the destination of the direct memory access connection associated with the message limit [Boyd, paragraph 122].

Regarding claims 7, 22 and 32, Boyd further discloses each direct memory access connection includes a network interface between an application of said host and a network connecting the host to the plurality of destinations and wherein said network interface includes a queue for each direct memory access connection and adapted to

queue messages to be sent through the direct memory access connection associated

with each queue [Boyd, paragraph 122], and

wherein said each sending of a message to specified memory location of the destination

of a direct memory access connection includes queuing the message in the network

interface queue associated with the direct memory access connection; and wherein the

queuing of messages in the network interface queue associated with a direct memory

access connection is suspended when the quantity of messages sent from said host to

the specified memory location of the associated direct memory access connection and

lacking a message acknowledgment of being received by the destination of the

associated direct memory access Connection reaches the separate message limit

imposed on the direct memory access connection associated with the network interface

queue [Boyd, paragraphs 122 and 69-74].

Regarding claims 8, 23 and 33, Boyd further discloses the queuing of messages in the

network interface queue associated with a direct memory access connection is resumed

when the quantity of messages sent from said host to the specified memory location of

the associated direct memory access connection and lacking a message

acknowledgment of being received by the destination of the associated direct memory

access connection is less than the separate message limit imposed on the direct

memory access connection associated with the network interface queue [Boyd,

paragraph 122].

Regarding claims 9, 24 and 34, Boyd further discloses the packet sending connection is a Transmission Control Protocol connection between the host and the destination and wherein each direct memory access connection is a Remote Direct Memory Access connection between the host and the destination of the direct memory access connection [Boyd, paragraph 7].

Regarding claims 10, 25 and 35, Boyd further discloses said network interface has a pool of empty messages which imposes a limit on the total quantity of messages sent from said host to all the specified memory locations of all the direct memory access connections and lacking a message acknowledgment of being received by the destination of the associated direct memory access connection and wherein each message limit is less than the network interface pool of empty messages [Boyd, paragraphs 119-122].

Regarding claims 11 and 36, Boyd further discloses each message limit is based, at least in par, on the number of active direct memory access connections of the host [Boyd, paragraphs 119-122].

Regarding claims 12 and 37, Boyd further discloses changing the size of a message limit of an active direct memory access connection prior to sending at least one message through the associated direct memory access connection [Boyd, paragraphs 119-123].

Regarding claims 13 and 38, Boyd further discloses each message limit is based, at least in par, on the number of active direct memory access connections of the host [Boyd, paragraphs 119-122].

Response to Arguments

5.   Applicant's arguments filed 06/17/2008 have been fully considered but they are not persuasive.

A – Applicant argues "the Examiner's citations to the Baratakke reference fail to teach or suggest a transmission window which is 'a function of the number of active connections of the host'".

A – Baratakke discloses there can be a plurality of connections [Baratakke, paragraph 17, lines 13-15] and that the number of packets sent is controlled due to a delay of packets on the connections [Baratakke, paragraph 22, lines 1-15], so it would be inherent that the reduced quantity is based on the connections that are experiencing a delay.

Conclusion

Examiner's Note: Examiner has cited particular paragraphs / columns and line numbers

in the reference(s) applied to the claims above for the convenience of the applicant.

Although the specified citations are representative of the teachings of the art and are

applied to specific limitations within the individual claim, other passages and figures

may apply as well. It is respectfully requested from the applicant in preparing

responses, to fully consider the references in entirety as potentially teaching all or part

of the claimed invention, as well as the context of the cited passages as taught by the

prior art or relied upon by the examiner.

Should applicant amend the claims of the claimed invention, it is respectfully requested

that applicant clearly indicate the portion(s) of applicant's specification that support the

amended claim language for ascertaining the metes and bounds of applicant's claimed

invention

6.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

         A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM J. GOODCHILD whose telephone number is (571)270-1589. The examiner can normally be reached on Monday - Friday / 8:00 AM - 4:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Cardone can be reached on (571) 272-3933. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

WJG

/Jason D Cardone/
Supervisory Patent Examiner, Art Unit 2145